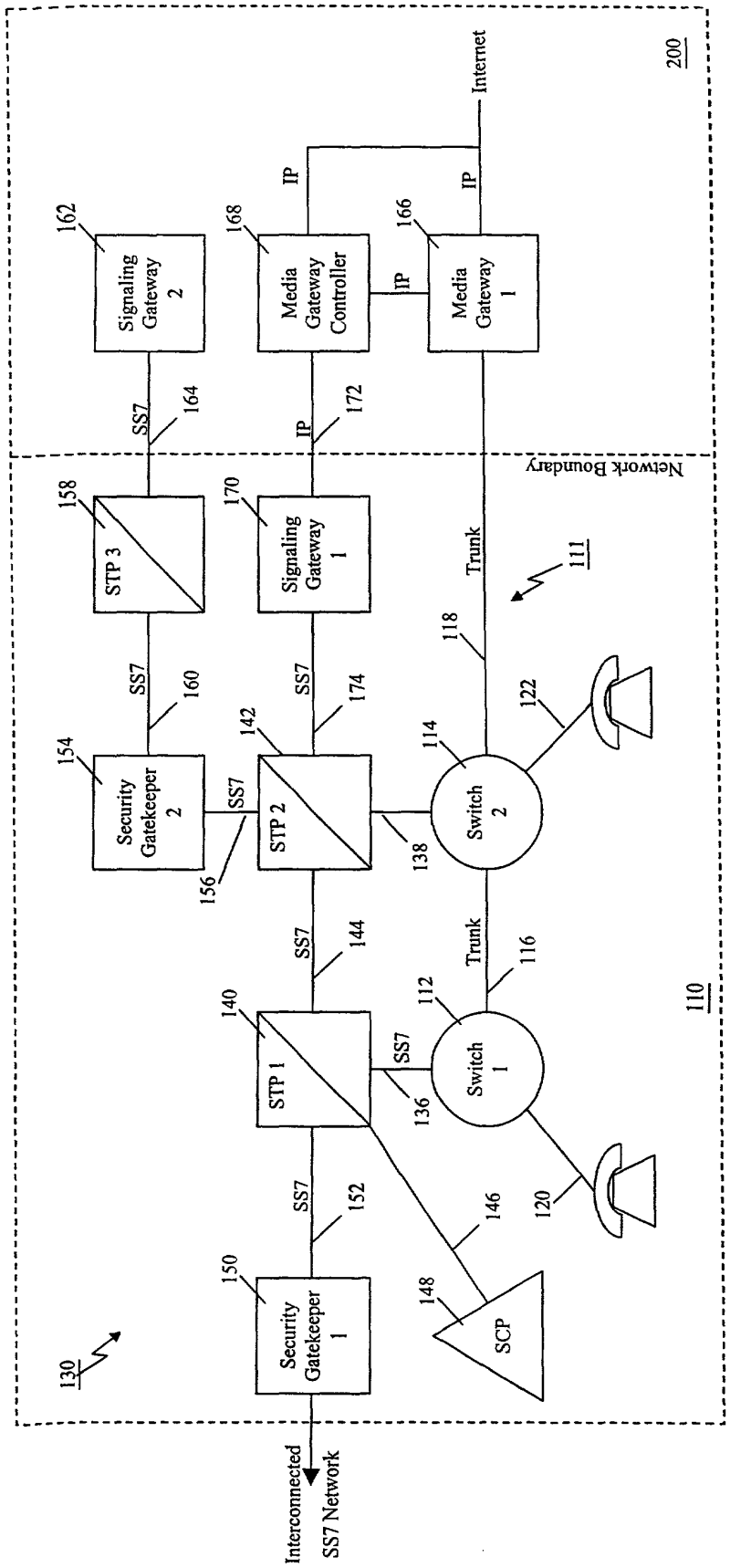

200
Internet
IP
IP
162
Signaling Gateway 2
168
Media Gateway Controller
166
Media Gateway 1
IP
SS7
164
IP
172
Network Boundary
158
STP 3
170
Signaling Gateway 1
Trunk
111
118
SS7
160
SS7
174
154
Security Gatekeeper 2
SS7
142
STP 2
114
Switch 2
122
156
138
SS7
144
Trunk
116
140
STP 1
112
Switch 1
SS7
136
110
SS7
152
146
120
150
Security Gatekeeper 1
148
SCP
130
100
Interconnected SS7 Network

Figure 1

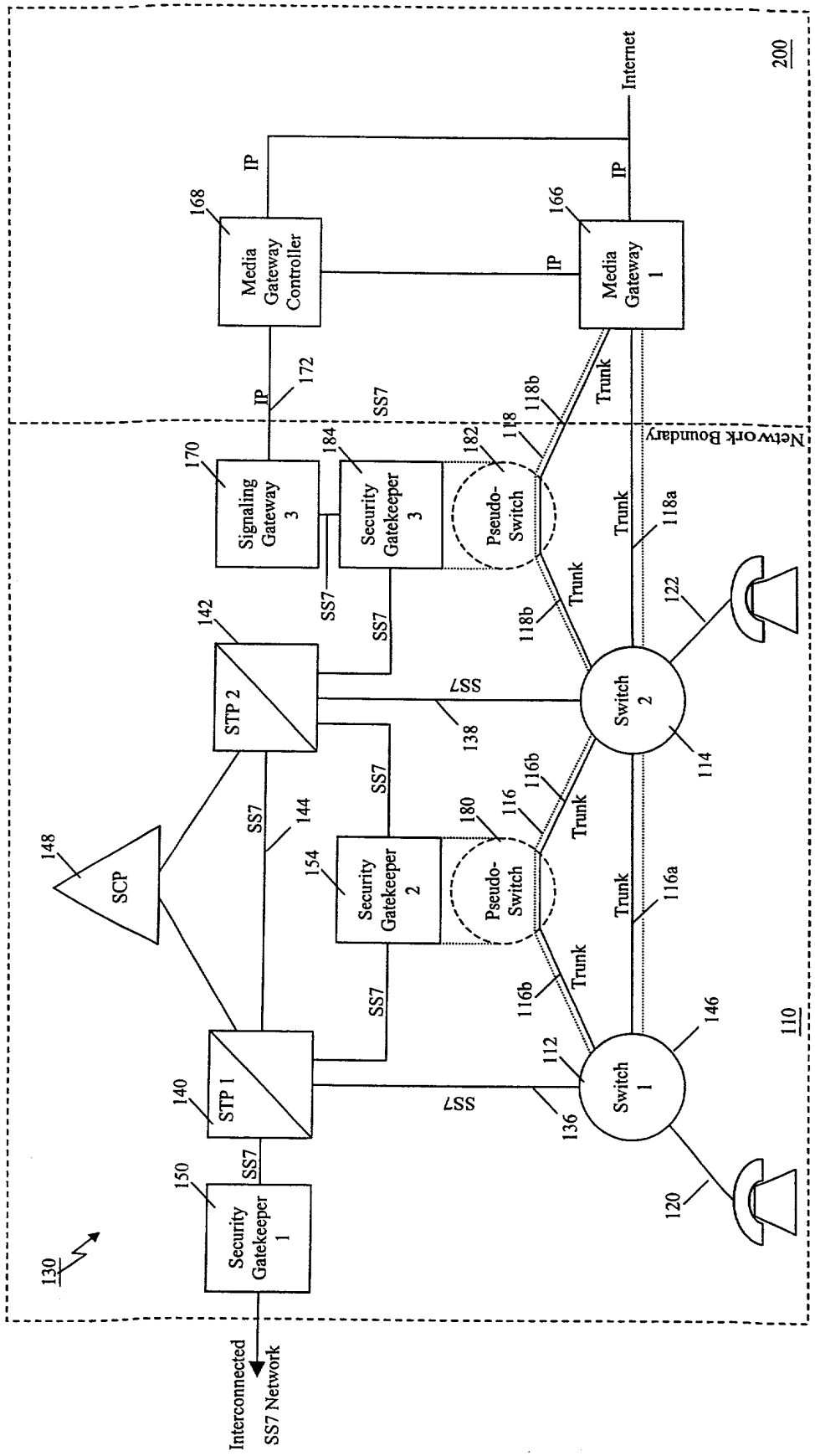

200
Internet
IP
IP
168
Media Gateway Controller
166
Media Gateway 1
IP
IP
172
SS7
Network Boundary
118b
118
Trunk
170
Signaling Gateway 3
184
Security Gatekeeper 3
182
Pseudo-Switch
Trunk
118a
SS7
SS7
118b
Trunk
122
142
STP 2
SS7
Switch 2
138
114
SS7
116b
116
180
Trunk
148
SCP
154
Security Gatekeeper 2
Pseudo-Switch
Trunk
116a
SS7
SS7
144
Trunk
116b
146
110
112
140
STP 1
SS7
Switch 1
136
150
Security Gatekeeper 1
120
130
100
Interconnected SS7 Network

Figure 2

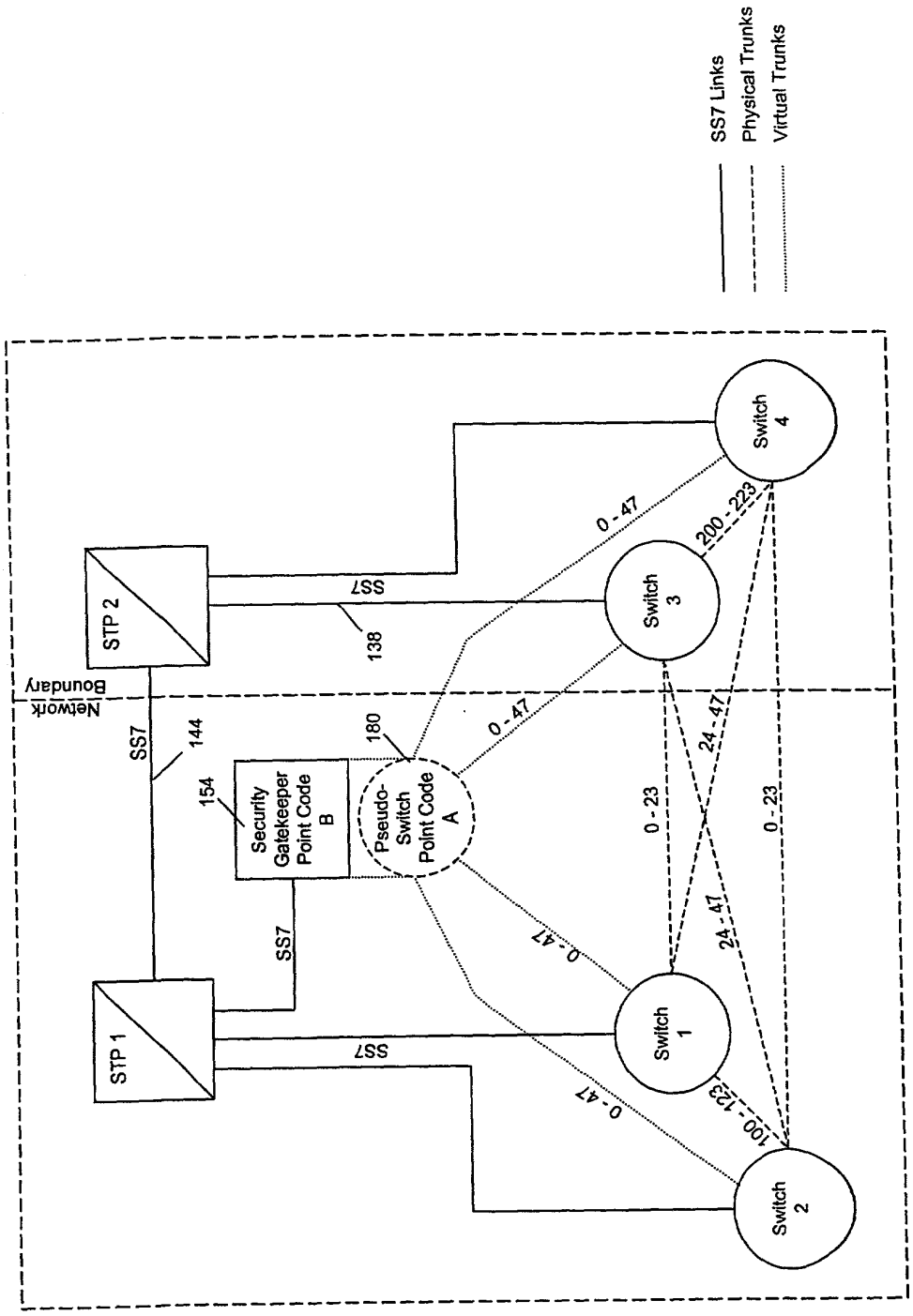

SS7 Links
Physical Trunks
Virtual Trunks
Switch 4
Switch 3
Switch 1
Switch 2
STP 2
STP 1
SS7
138
144
154
180
Security Gatekeeper Point Code B
Pseudo-Switch Point Code A
Network Boundary
0 - 47
200 - 223
0 - 23
24 - 47
100 - 123

Figure 3

2002171 "6725650

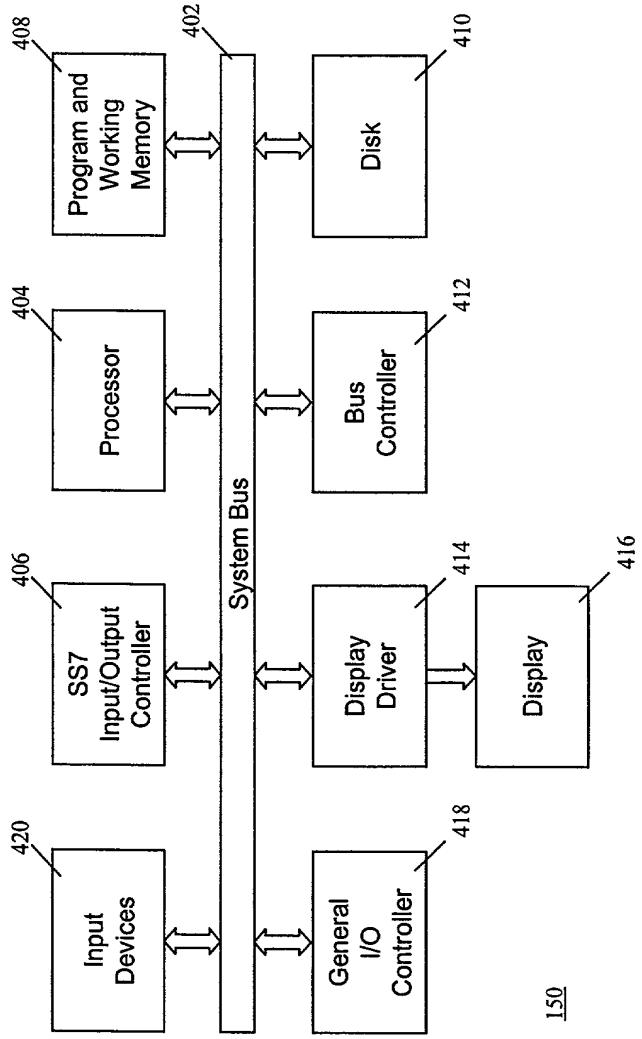
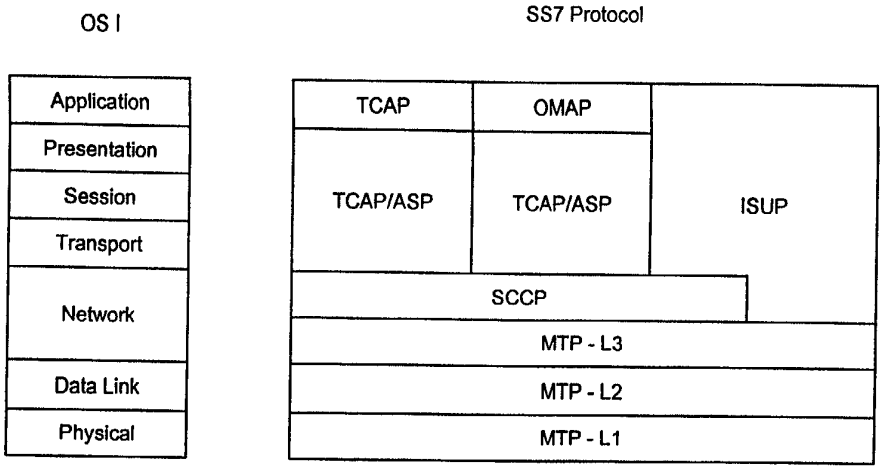


Figure 4

20623D*67728660



Legend

ASP - Application Service Part (Connection Oriented Protocols
MTP - Message Transfer Part (L1, L2 & L3)
OMAP - Operations, Maintenance, Application Part
SCCP - Signaling Connection Control Part
TCAP - Transaction Capability Application Part

Figure 5

FULBRIGHT & JAWORSKI, L.L.P.
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Inventor(s): Arthur DOSKOW, et al.
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Title: METHOD OF AND APPARATUS FOR MEDIATING COMMON...

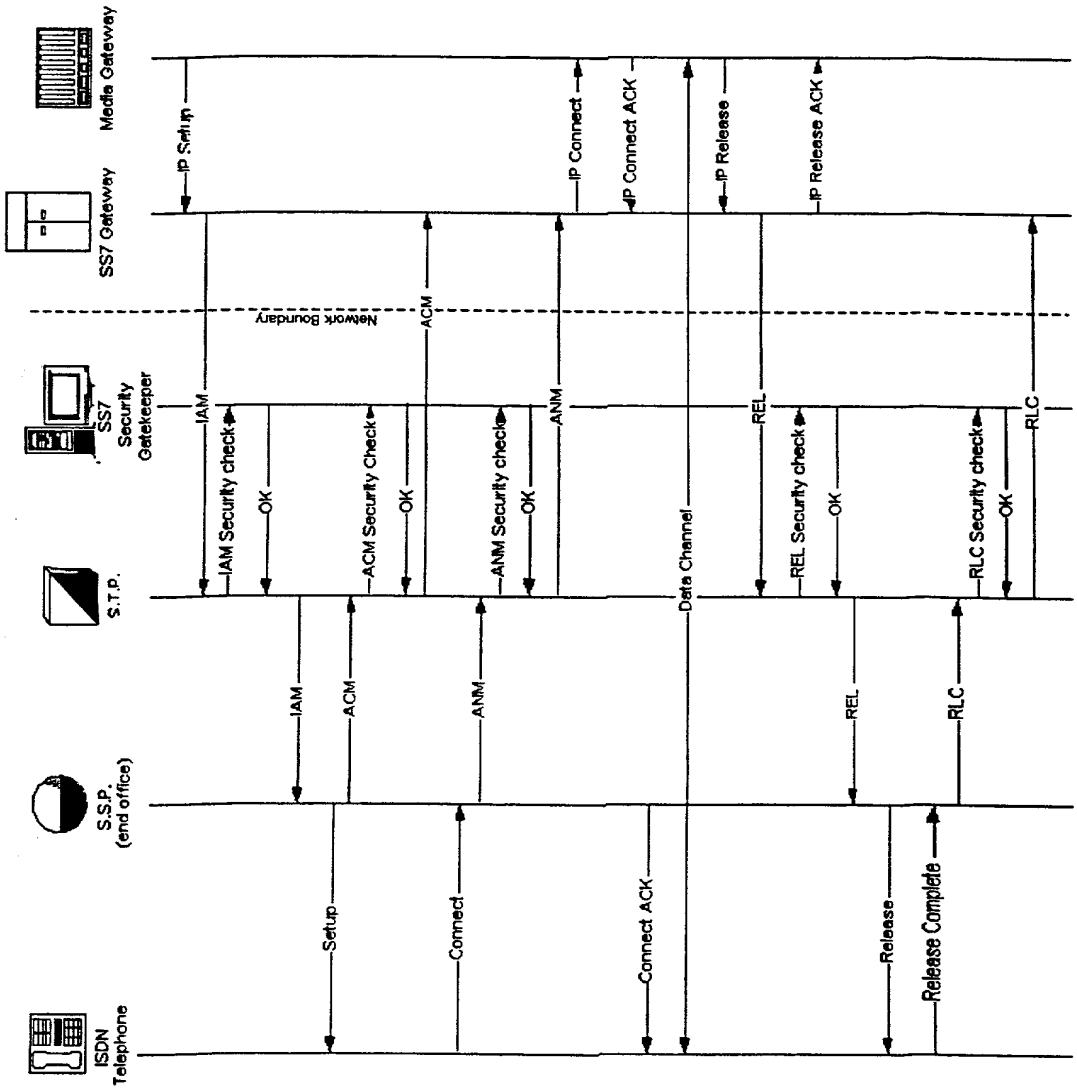
Media Gateway
SS7 Gateway
Network Boundary
SS7 Security Gatekeeper
S.T.P.
S.S.P. (end office)
ISDN Telephone
IP Setup
IP Connect
IP Connect ACK
IP Release
IP Release ACK
ACM
IAM
ANM
REL
RLC
IAM Security check
OK
ACM Security Check
OK
ANM Security check
OK
Data Channel
REL Security check
OK
RLC Security check
OK
IAM
ACM
ANM
REL
RLC
Setup
Connect
Connect ACK
Release
Release Complete

Figure 6

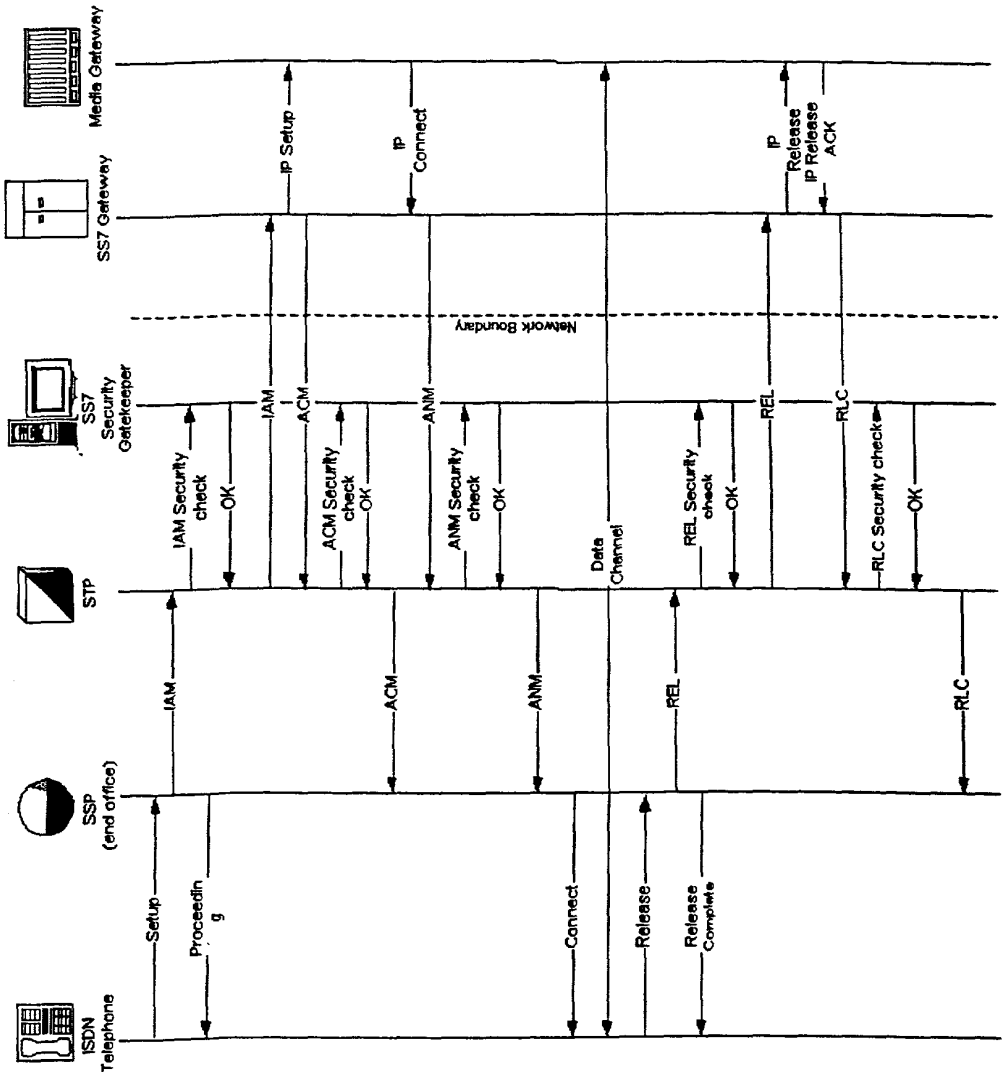
Media Gateway
SS7 Gateway
SS7 Security Gatekeeper
STP
SSP (end office)
ISDN Telephone
IP Setup
IP Connect
IP Release
IP Release ACK
Network Boundary
IAM
ACM
ANM
REL
RLC
IAM Security check
OK
ACM Security check
OK
ANM Security check
OK
Data Channel
REL Security check
OK
RLC Security check
OK
Setup
Proceeding
Connect
Release
Release Complete

Figure 7

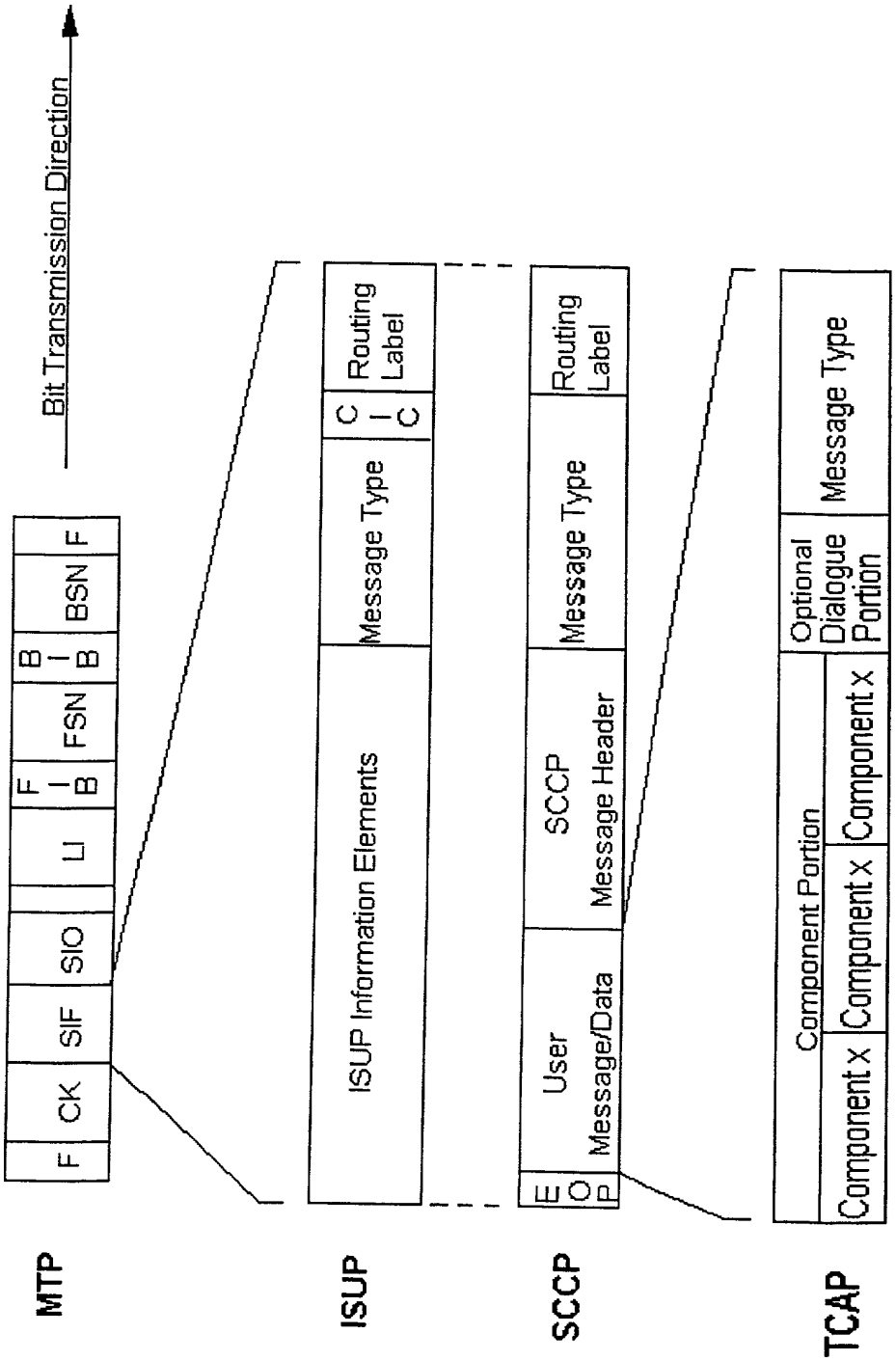
Bit Transmission Direction
MTP
F
CK
SIF
SIO
LI
F I B
FSN
B I B
BSN
F
ISUP
ISUP Information Elements
Message Type
C I C
Routing Label
SCCP
E O P
User Message/Data
SCCP Message Header
Message Type
Routing Label
TCAP
Component Portion
Component x
Component x
Component x
Optional Dialogue Portion
Message Type

Figure 8

PATENT

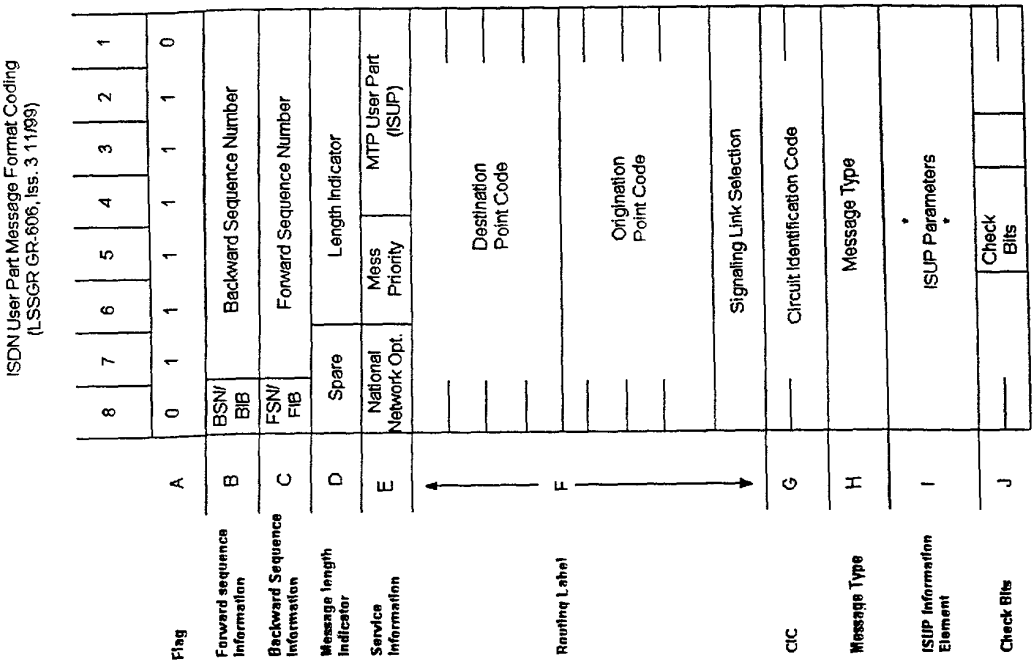

Figure 9

20020718.0128660

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Attny Docket: 414.042CIP/09990951
Inventor(s): Arthur DOSKOW, et al.
Serial No.: 09/982,179
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Title: METHOD OF AND APPARATUS FOR MEDIATING COMMON...
Sheet 10 of 15

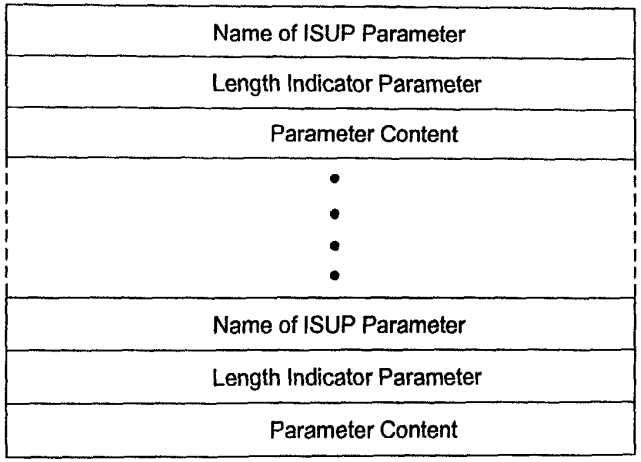

Figure 10

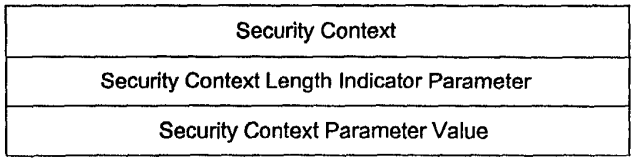

Figure 11

Security Context Values

Value	Meaning
0	Not used.
1	Data Encryption Algorithm
2	Integrity Check
3	Message Code Authentication
4	Sequence, Timestamp and Identification

Figure 12

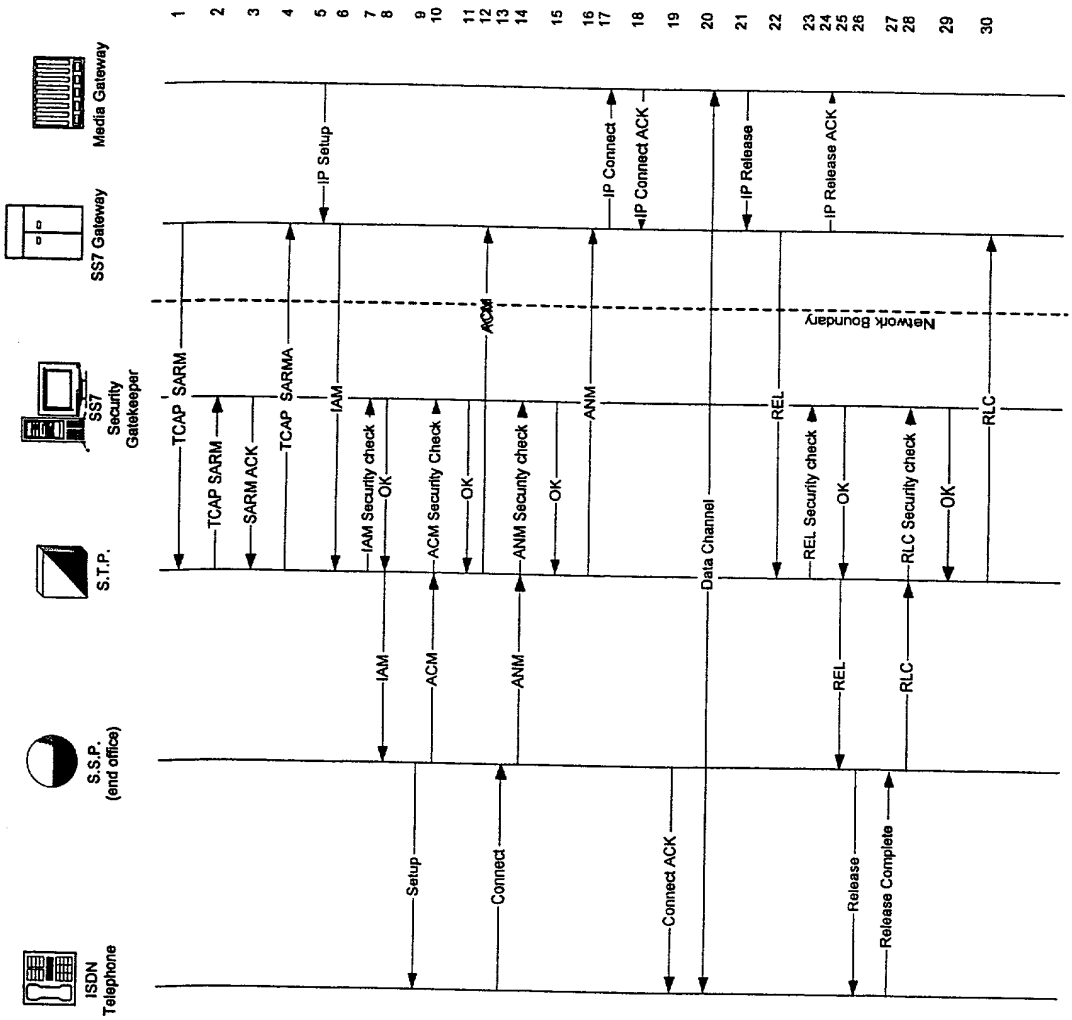
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
Media Gateway
SS7 Gateway
SS7 Security Gatekeeper
S.T.P.
S.S.P. (end office)
ISDN Telephone
IP Setup
IP Connect
IP Connect ACK
IP Release
IP Release ACK
Network Boundary
TCAP SARM
TCAP SARM
SARM ACK
TCAP SARMA
IAM
ACM
ANM
REL
RLC
IAM Security check
OK
ACM Security Check
OK
ANM Security check
OK
REL Security check
OK
RLC Security check
OK
Data Channel
IAM
ACM
ANM
REL
RLC
Setup
Connect
Connect ACK
Release
Release Complete

Figure 13

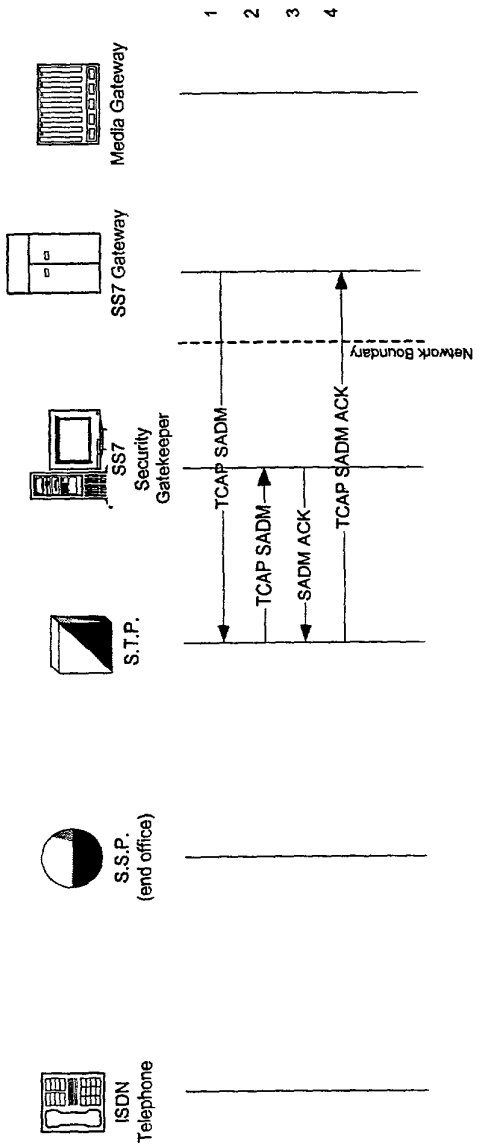
1
2
3
4
Media Gateway
SS7 Gateway
Network Boundary
SS7 Security Gatekeeper
TCAP SADM
TCAP SADM
SADM ACK
TCAP SADM ACK
S.T.P.
S.S.P. (end office)
ISDN Telephone

Figure 14

20020710 6713866

Initial Address Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 1	
Nature of Connection Indicators	
Forward Call Indicator Bits H..A	
Forward Call Indicator Bits P..I	
Calling Party Category	
Offset of 1st Mandatory Var. Parameter	
Offset of 2nd Mandatory Var. Parameter	
Offset of Start of Operational Part	
Length Indicator of User Service Info	
User Service Information No. of Octets = Length Indicator Value	
Length Indicator of Called Party No.	
Called Party Number No. of Octets = Length Indicator Value	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 15

Address Complete Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 6	
Backward Call Indicator Bits H..A	
Backward Call Indicator Bits P..I	
Offset to Start of Optional Part	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 16

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PO6210 * 6/7/2002

Answer Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 9	
Offset to Start of Optional Part	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 17

Release Complete Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 16	

Fig. 19

Release Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 12	
Offset of 1st Mandatory Var. Parameter	
Offset of Start of Operational Part	
Length Indicator of Cause Indicators	
Release Cause Indicator Parameter No. of Octets = Length Indicator Value	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig 18

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Sheet 14 of 15

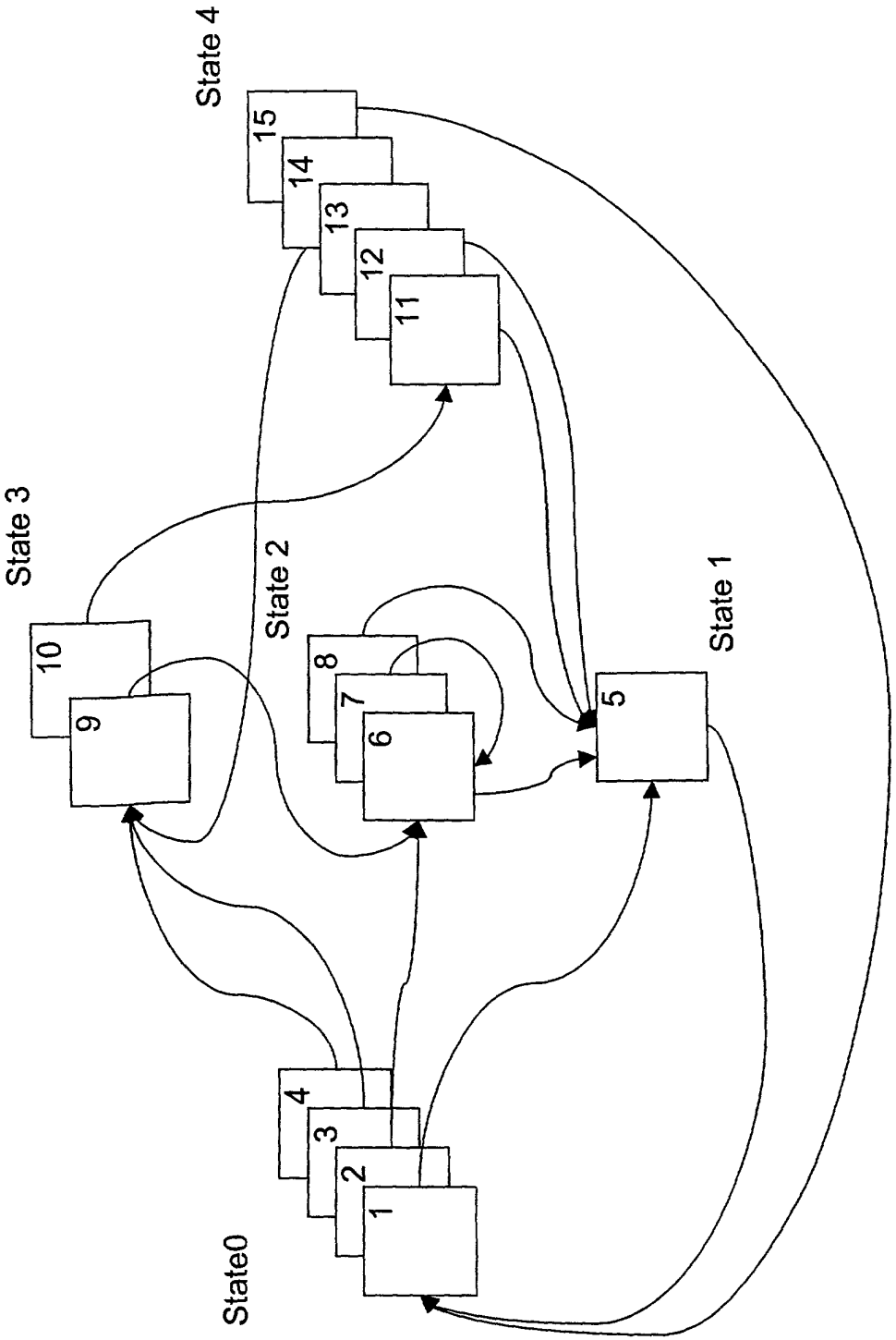
State 4
15
14
13
12
11
State 3
State 2
State 1
10
9
8
7
6
5
4
3
2
1
State0

Fig. 20